

REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

Disposition of Claims

Claims 1, 4-5 and 7-8 are pending in this application. Claim 1 is independent. The remaining claims depend directly from claim 1.

Claim Amendments

Claim 1 was amended by this reply to clarify the thrusting and heating steps recited. No new matter has been added.

Rejection under 35 U.S.C. § 112

Claims 1, 4, 5, 7, and 8 are rejected under 35 U.S.C. § 112, ¶ 1 as failing to comply with the written description requirement. Claim 1 has been amended to remove the phrase “and does not include an epoxy resin.” Thus, this rejection is now moot. Withdrawal of the rejection is respectfully requested.

Claim 7 is rejected under 35 U.S.C. § 112, ¶ 2, as being indefinite. Claim 1 has been amended to remove the phrase “and does not include an epoxy resin,” and therefore, claim 7 is no longer inconsistent with claim 1. Thus, this rejection is now moot. Withdrawal of the rejection is respectfully requested.

Rejection(s) under 35 U.S.C. § 103

Claims 1, 7, and 8 are rejected under 35 U.S.C. § 103(a) as being obvious over JP 07-026235 (“JP ‘235”) or JP 11-343474 (“JP ‘474”) in view of JP 62-004769 (“JP ‘769”), JP 09-330947 (“JP ‘947”), and optionally JP 61-078822 (“JP ‘822”). This rejection is respectfully traversed.

Independent claim 1 of the present application recites a method for producing an electrical device made up by a first object for bonding including a first electrode and a second object for bonding including a second electrode to be connected to said first electrode, by bonding said first object for bonding and said second object for bonding to each other, comprising the steps of:

- arranging an adhesive, mainly containing a thermosetting resin and a silane coupling agent as a first curing agent, at least on said first electrode, to form an adhesive layer, wherein electrically conductive particles are added to said adhesive from the outset;
- arranging a second curing agent, reacted with said first curing agent by heating to polymerize said thermosetting resin, at least on said second electrode, to form a curing agent layer, said second curing agent being mainly composed of an aluminum chelate;
- positioning said first and second electrodes in register with each other;
- tightly contacting said adhesive layer on said first object for bonding with the curing agent layer on said second object for bonding;
- thrusting and heating said first and second objects against each other to soften said adhesive layer and mix said first and second curing agents and put said electrically conductive particles between said first and second electrodes, and

- further thrusting and heating said first and second objects against each other to develop a cation by reaction of said silane coupling agent as a main component of said first curing agent and said aluminum chelate as a main component of the second curing agent to allow said thermosetting resin to be cationically polymerized.

Thus, according to claim 1, the first curing agent mainly composed of a thermoset resin and a silane coupling agent and the second curing agent mainly composed of an aluminum chelate are arranged on separate objects for subsequent bonding. Therefore, the silane coupling agent and the aluminum chelate do not react and generate cations until the adhesive layer is softened and the first and second objects are thrust together and heated. Because of this separation, cationic polymerization of the thermosetting resin does not occur until the objects are brought together and heated, thereby maintaining long shelf life and high adhesion intensity.

Both of JP '235, which discloses an electrically conductive paste, and JP '474, which discloses an adhesive composition, include a material that contains an aluminum compound and a silicon system compound. However, JP '235 and JP '474 are distinct from the claims of the present application, because as required by claim 1, the aluminum compound and the silicon system compound are separated from each other, arranged in different adhesive materials.

The inventors of the present invention have unexpectedly found that by generating (from silanes and aluminum chelates) the cations *in situ* when needed, using the components recited in claim 1, it becomes possible to polymerize the resins at significantly lower temperatures and the products have markedly better adhesive strength (as assessed by the peel-off strength; see Table 1 reproduced below). Low peel strengths would be expected from the electrically conductive paste of JP '235 as well as the adhesive composition of JP '474, particularly as compared to the

unexpectedly good peel strengths that are achieved by the present invention. Based on such low peel strengths, it would be impossible to realize a high connection reliability using the adhesives of JP '235 and JP '474.

The Examiner admits that JP '235 and JP '474 do not teach separation of the first and second curing agents (*i.e.*, separation of the aluminum compound and silicon compound), but instead assert that it is well known in the art of adhesives to apply a thermosetting epoxy resin to a first object and a curing agent to a second object, citing the teachings of JP '769 as evidence for such assertion. Applicant notes that the teachings of JP '769 are limited to application of a principal ingredient of a two-pack adhesive to one object and the hardener thereof to the second object. JP '769 does not indicate the types of resin or curing agent used in the adhesive or the use of a two-component curing agent system for polymerizing the resin. Accordingly, JP '769 also does not suggest that a cation is generated to polymerize the thermosetting resin after a silane coupling agent (as the main component of the first curing agent) is reacted with an aluminum chelate (as the main component of the second curing agent) by thrusting together and heating the two objects on which they are individually applied.

The Examiner attempts to conclude that the combination of JP '235 or JP '474, as modified by JP '769, teaches applying to a first object the epoxy resin, the first or second curing agent, and the electrically conductive particles; and applying to a second object the other of the first or second curing agent. However, this conclusion is not supported by the references. Rather, no reference has suggested separation of the first and second curing agent. The only separation suggested is between the resin and the curing agent. Thus, the combination of JP '235 or JP '474,

as modified by JP '769, would be apply the epoxy resin on one object and the aluminum compound and silicon compound together on the second object.

JP '822 discloses a rapid curing epoxy resin composition that is a composition of a two-component system consisting of a compound A including a cycloaliphatic epoxy and a silanol compound and a compound B including acid anhydride and an aluminum compound. The compounds A and B are mixed, and the mixed compound is applied to an object. Then, a cured object is generated by heating. However, compounds A and B (*i.e.*, the aluminum compound and the silicon compound) are not maintained on separate objects, as required by the present application.

JP '947 is cited for the proposition that the first object includes a first electrode and the second object includes a second electrode (because the Examiner states it is unclear if JP '235 teaches such electrodes) to produce an electrical device. Other than the use of electrically conductive particles and a curable resin, there is no discussion or suggestion in JP '947 of the types of components used on the first and second layers, much less whether the aluminum compound and the silicon compound are maintained on separate objects.

A *prima facie* case of obviousness requires that all claim limitations be taught or suggested by the prior art. See *In re Royka*, 490 F.2d 981 (CCPA 1974); MPEP §§ 706.02(j), 2143.03. If even a single claim limitation is not taught or suggested by the prior art, then that claim cannot be obvious over the prior art. *Id.* In the present case, none of JP '235, JP '474, JP '769, JP '947, or JP '822 show or suggest the separation of a silane coupling agent and an aluminum chelate on two separate objects. Moreover, not only is there no disclosure of such separation of

components, there exists no suggestion, incentive, or foundation for one of ordinary skill in the art to modify the references to arrive at the claimed invention, in violation of MPEP § 2143.01.

Further, the use of this number of references in formulating the rejection indicates that the Examiner, using the present application as a guide, has selected isolated features of the various relied-upon references to arrive at the limitations of the claimed invention. Applicant reminds the Examiner that use of the present application as a “road map” for selecting and combining prior art disclosures is wholly improper. See MPEP § 2143; *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132 (Fed. Cir. 1985) (stating that “[t]he invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time”); *In re Fritch*, 972 F.2d 1260 (Fed. Cir. 1992) (stating that “it is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious This court has previously stated that ‘one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.’”); *In re Wesslau*, 353 F.2d 238 (C.C.P.A. 1965) (stating that “it is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art”)

Thus, because JP ‘235, JP ‘474, JP ‘769, JP ‘947, and JP ‘822, whether considered alone or in combination, fail to show or suggest every claim limitation, as recited in independent claim 1, independent claim 1 is patentable over JP ‘235, JP ‘474, JP ‘769, JP ‘947, and JP ‘822.

Dependent claims are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '474 in view of JP '769, JP '947, and optionally JP '822. This rejection is respectfully traversed.

As shown above, independent claim 1, from which claim 4 depends, is patentable over JP '235, JP '474, JP '769, JP '947, and JP '822. Similarly, claim 1 is also patentable over the four of such references, JP '474, JP '769, JP '947, and JP '822. Dependent claim 4 is patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '235, JP '769, JP '947, and optionally JP '822, as applied to claims 1, 7, and 8 above, and further in view of JP '474. This rejection is respectfully traversed.

As shown above, independent claim 1, from which claim 4 depends, is patentable over JP '235, JP '474, JP '769, JP '947, and JP '822. Dependent claim 4 is patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '235 in view of JP '769, JP '947, and optionally JP '822. This rejection is respectfully traversed.

As shown above, independent claim 1, from which claim 5 depends, is patentable over JP '235, JP '474 JP '769, JP '947, and JP '822. Similarly, claim 1 is also patentable over the

four of such references, JP '235, JP '769, JP '947, and JP '822. Dependent claim 5 is patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '235 or JP '474 in view of JP '769, JP '947, and optionally JP '822, as applied to claims 1, 7, and 8, and further in view of JP 09-067427 ("JP '427"). This rejection is respectfully traversed.

As shown above, independent claim 1, from which claim 5 depends, is patentable over JP '235, JP '474 JP '769, JP '947, and JP '822. The Examiner states that it is unclear whether JP '235 and JP '474 teach the claimed silane coupling agent. Thus, the Examiner cites JP '427 to assert it would be obvious to use the silane coupling agents having an alkoxy group and epoxy ring as the silane coupling agent in JP '235 or JP '474. However, the teachings of JP '427 are limited to a silane coupling agent modified phenol resin obtained by reacting a specific silane coupling agent with a phenol resin. Nowhere in JP '427 is there a teaching of the separation of a silane coupling agent and an aluminum chelate on two separate objects, as required by claim 1.


Thus, because JP '235, JP '474, JP '769, JP '947, JP '822, and JP '427, whether considered alone or in combination, fail to show or suggest every claim limitation, as recited in independent claim 1, independent claim 1 is patentable over JP '235, JP '474, JP '769, JP '947, and JP '822. Dependent claim 5 is patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 17155/003001).

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Respectfully submitted,

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